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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/547,194

11/02/2005

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EXAMINER

NGUYEN, TRAN N

ART UNIT

PAPER NUMBER

2834

MAIL DATE

DELIVERY MODE

10/24/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/547,194	Applicant(s) ABOU-AKAR ET AL.	
	Examiner Tran N. Nguyen	Art Unit 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 8-10, 13-15, 17-23 and 31-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 32-34 is/are allowed.
- 6) ☒ Claim(s) 1-5, 8-10, 13-15, 17-23 and 31 is/are rejected.
- 7) ☒ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 August 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED OFFICE ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. **Claims 1-5, 8-10, 13-15, 17-18, 20-23 and 31** are rejected under 35 U.S.C. 103(a) as being unpatentable over one of the prior-art: **Bianchi, EP 1164684A, DE 19723302A, and DE 3016540A**, in view of **Nitta et al (US 6,265,804)**.

Bianchi discloses a synchronous electrical machine (figs 9b-10b) comprising: a stator (figs 9b-10b); and at least one rotor (figs 9b-10b) having permanent magnets, wherein, as disclosed illustrated by the graphs thereof, the machine is designed so as to have $X_d > X_q$, where X_d is the direct reactance and X_q is the quadrature reactance; and the ratio of $X_d/X_q > 1.1$ or $X_d/X_q > 1.5$ and the ratio X_d/X_q is ≈ 3 , or wherein: $X_q I_o/E$ is between 0.33 and 0.6, or between 0.66 and 1; and wherein the rotor is a flux-concentrating rotor, the permanent magnets (unnumbered) of the rotor being placed between pole pieces, each has a convex face turned toward the stator (figs 10a-10b). *Regarding claims 2-5, 20 and 31*, as disclosed and illustrated by the graphs, **Bianchi** discusses the range of the ratio of X_d/X_q , one may disagree that Bianchi's ratio range to be equal to the recited range of the present invention.

Nevertheless, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the Bianchi's machine to obtain a preferable optimum range so that the ratio of $X_d/X_q > 1.1$ or $X_d/X_q > 1.5$ and the ratio X_d/X_q is ≈ 3 , or wherein:

X_{qIo}/E is between 0.33 and 0.6, or between 0.66 and 1. Doing so would further enabling the permanent-magnet synchronous motor to extend flux-weakening capabilities and enhance the overall efficiency; such modification has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

In alternation, **EP 1164684A (fig 4)** or alternately **DE 19723302A (figs 1-2)**, each discloses a synchronous electrical machine comprising: a stator (not shown, but inherently); and at least one rotor having permanent magnets, wherein the machine is designed so as to have $X_d > X_q$, where X_d is the direct reactance and X_q is the quadrature reactance; and the ratio of $X_d/X_q > 1.1$ or $X_d/X_q > 1.5$; and the rotor is a flux-concentrating rotor, the permanent magnets of the rotor being placed between pole pieces, each has a convex face turned radially outward.

Another alternation, **DE 3016540A (figs 1-2)**, each discloses a synchronous electrical machine comprising: a stator (not shown, but inherently); and at least one rotor having permanent magnets, wherein the machine is designed so as to have $X_d > X_q$, where X_d is the direct reactance and X_q is the quadrature reactance; and the ratio of $X_d/X_q > 1.1$ or $X_d/X_q > 1.5$; and the rotor is a flux-concentrating rotor, the permanent magnets (4-5) of the rotor being placed between pole pieces (2), each has a convex face turned radially outward (toward where the stator would be), wherein the each of the permanent magnets of the rotor lies radially set back from the circumferential ends of the convex portions of the two adjacent pole pieces (fig 1).

Individually each one of the refs **Bianchi, EP 1164684A, DE 19723302A, and DE 3016540A** substantially discloses the claimed invention, except for the limitations of the stator has teeth, each carrying at least one individual coil, wherein the teeth of the stator are devoid of pole shoes.

Nitta, however, teaches a stator (fig 6) has teeth, each carrying at least one individual coil, wherein the teeth of the stator are devoid of pole shoes for the purpose of facilitating coil winding as well as reducing iron loss.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the machine by modifying the stator with features, as taught by Nitta. Doing so would reduce iron loss as well as make coil winding easy.

Regarding claims 10, 14 and 19, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the Bianchi's machine to obtain the preferable optimum ranges of the following:

the convex portion of a pole piece has a radius of curvature of between 20% and 30% of the inside radius of the stator, or

the setback (r) in the radial direction of the magnets relative to the circumferential ends of the convex portions lies between 10% and 20% of the inside radius of the stator, or

Configure the stator having $6n$ teeth and the rotor has $6n \pm 2$ poles, n being greater than or equal to 2.

Doing so would further enabling the permanent-magnet synchronous machine to enhance the overall efficiency; such modification has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Regarding claims 21- 22, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the machine so that it would be have an output power of 0.5KW or constitute as a generator. Doing so would be a matter of implementing the industrial use of the machine to provide output requirment or to operate as a generator in order to converting mechanical input into electrical output for generating electric.

Allowable Subject Matter

2. **Claim 32-34** are allowed.

Response to Arguments

3. Applicant's arguments filed 9/27/07 have been fully considered but they are not persuasive.

The applicant argues that each one of **Bianchi, EP 1164684A, DE 19723302A, and DE 3016540A** discloses stator poles having pole shoes instead of devoicing pole shoes as in the claimed invention. Consequently, one of ordinary skill in the art would not have considered use of the rotors disclosed by Nitta for providing rotors with smooth poles. Thus, there would have been no reason to combine; therefore, it is impermissible hindsight.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In this instant case, Nitta discloses a stator with poles that are being configured without pole-shoes for the purpose of facilitating coil winding as well as reducing iron loss. One skilled in the art would understand that besides the advantages of facilitating coil winding and reducing iron loss, the stator pole without pole shoes would have a constant cross-section over their entire height and the width of the slots along side the stator tooth heads is substantially equal to the width of these heads to minimize the parasitic reluctant

effect due to the slots. **Furthermore, the Examiner takes Official Notice those statots having poles without pole shoes are well known in the art (see cited refs for evidence supporting this statement).**

Thus, the rejections are proper, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Communication

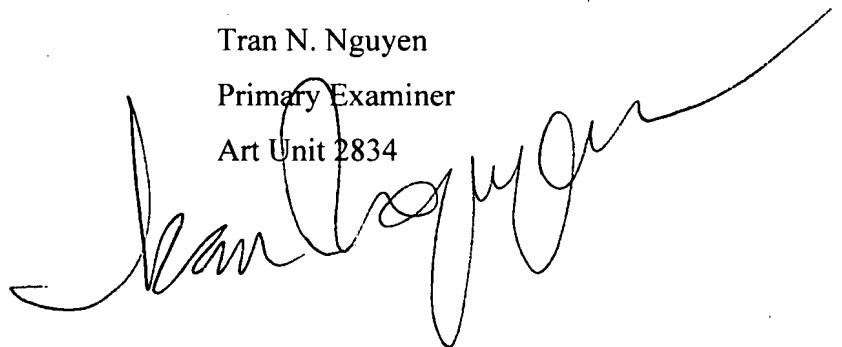
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tran N. Nguyen whose telephone number is 571-272-2030. The examiner can normally be reached on 7:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. (**Note: Use this Central Fax number 571-273-8300 for all official response.**)

Do **not** use the Examiner's RightFax number without informing the Examiner first because, according to the USPTO policy, any document being sent via RightFax is treated as unofficial response and will not be officially dated until it is routed to the Central Fax.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tran N. Nguyen
Primary Examiner
Art Unit 2834

A handwritten signature in black ink, appearing to read 'Tran N. Nguyen', is written over the typed name and title. The signature is fluid and cursive, with a long horizontal stroke extending to the right.